

IN THE ABSTRACT

Please substitute the Abstract on the next, separate page hereof.

## ABSTRACT

The present invention relates to an optimum designing method of matching layers of a thickness-mode piezoelectric transducer in which a front load effective impedance when viewing in a load direction from a front side of a piezoelectric plate is used as a design parameter when designing an acoustic matching layer. An impedance characteristic of each acoustic matching layer is determined using a new matching formula. An optimized design parameter is determined in a region in which an amplitude in a peak amplitude contour map and a depth of a pulse width contour map using video waveforms for statistically evaluating a sensitivity and resolution of a piezoelectric transducer.